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19 February 1969

MEMORANDUM FOR: Deputy for Operations, OSA  
IDEALIST/Operations, OSA  
Deputy for Materiel, OSA

SUBJECT: Provision for use of Bottled Gas for IRIS II Configuration

1. Subject of this memorandum relates to developing a backup system to provide gas to the air bars of the IRIS II configuration and what must be done if this capability is deemed necessary. At the present time, a piston-type air compressor is utilized to provide air to the air bars.
2. As of 14 February 1969 we have had three flights utilizing the air compressor. Analysis of the photography and data from instrumentation package have not been completed as of this date. However, preliminary readout does indicate vibrations originating from the compressor do degrade ground resolution.
3. The air bottle backup provision is being investigated for the following reasons:
  - A. At this time, we do not know what degrading effects vibrations of air compressor will have upon imagery, electronic and mechanical units, etc. It is possible isolators on compressor/hatch mounts may reduce vibrations.
  - B. No history of reliability when compressor is operating in an operational environment is available. This, of course, would be derived over a period of useage as will possible accumulative problems. If findings are adverse, we should have backup.
  - C. Certain components of an air bottle system need lead times, i.e., reducing valve requires about 4 weeks to procure. However, 13 are on order. It would take about 4 to 5 weeks to fabricate air bottle racks.
4. To attain an air bottle capability for the U-2R, the following will be required:

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- A. Brackets to hold the air bottle racks would have to be installed in all aircraft.
  - B. The air bottle rack would have to be redesigned to hold four (4) air bottles. Present rack holds three (3) air bottles, each bottle capable of supplying about  $1\frac{1}{2}$  hours of nitrogen to the air bars. The addition of the fourth bottle would give us a 6 hour photo capability. The smaller bottle attached to the configuration gives an additional  $\frac{1}{2}$  hour of nitrogen. This can handle preflight and climbout requirements.
  - C. Two reducing valves required for each air bottle system, one for the small makeup bottle and the other for the four (4) bottle setup.
  - D. Air bottle racks would have to be fabricated. ITEK and LAC reps at Edwards AFB checked if four bottle rack would fit on rear bulkhead of Q-bay and their findings were it would be snug but would fit.
  - E. Sufficient nitrogen on hand to charge the gas bottles. A 6 hour mission would take about 3500 cubic inches of nitrogen. Bottles are charged to 1900 psi.
  - F. Certain circuitry changes would have to be made. This would entail having interchangeable electrical harnesses from panel to configuration, one when air bottles were used and another when compressor was utilized. Control panel operation would be same for both systems.
5. It is not anticipated it will be necessary to have a gas bottle system assigned to each aircraft. If each aircraft would have brackets in place or available, it would take approximately 30 to 45 minutes to install a four bottle rack and attach appropriate plumbing and wiring. Under these conditions, it is suggested the following would meet our requirements:
- A. Fabricate two (2) four bottle racks, one to be assigned to Detachment G and the other to Det. H. Although ITEK fabricated three bottle racks now being utilized, LAC should be approached to produce subsequent racks.

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B. Provide six (6) large air bottles for each detachment. Four of these would be in rack and two would be spares. The spares would be utilized in the event there is physical damage (i.e., deep scratches or scarring); contamination, etc.

C. Two (2) spare reducing valves per detachment.

D. Two (2) sets of alternate electrical harnesses.

6. Recipients and addressees of this memorandum are requested to express their opinions pertaining to contents of this memo and their concurrence with paragraph 5.

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